CLAIMS

1. Method of operating a fuel igniter in an engine, comprising:

a) generating a first plasma near a first end of a first electrode;

b) maintaining a second electrode having a second end;

c) initially surrounding the second end with a solid insulation; and

d) eroding the solid insulation, to expose the second end, and then generating a second plasma between the first and second electrodes.

2. Method according to claim 1, wherein the first plasma is a cause of eroding the solid insulation.

3. Method according to claim 1, wherein the first plasma is generated within a medium and the solid insulation has a higher breakdown strength than the medium.

4. Method according to claim 1, wherein a current in the second electrode accompanies the second plasma, and further comprising:

e) detecting the current and issuing a signal in response.

5. Method according to claim 4, and further comprising:

f) replacing the fuel igniter with a different fuel igniter in response to the signal.

6. Method according to claim 5, and further comprising:

g) in the different fuel igniter,

i) generating a first plasma near a first end of a first electrode;

ii) maintaining a second electrode having a second end;

iii) initially maintaining a solid insulation completely surrounding the second end; and

iv) eroding the solid insulation, to expose the second end, and then generating a second plasma between the first and second electrodes.

7. Method according to claim 1, wherein the engine comprises a gas turbine.

8. Method according to claim 6, wherein the engine comprises a gas turbine.

9. An igniter for a gas turbine engine, comprising:

a) a first electrode having a tip;

b) a second electrode which cooperates with the tip to generate a plasma; and

c) a third electrode having no exposure to the tip when the igniter is newly installed, but which develops exposure to the tip after a period of operation.

10. Igniter according to claim 9, and further comprising:

d) an insulator surrounding the first electrode.

11. Igniter according to claim 10, wherein the second electrode surrounds the insulator.

12. Igniter according to claim 11, wherein the third electrode is insulated from both the first and second electrodes.

13. Igniter according to claim 9, and further comprising a sensor connected to the third electrode, for detecting current in the third electrode.

14. An igniter for a gas turbine engine, comprising:

a) a first electrode having a tip;

b) an insulator surrounding the first electrode;

c) a second electrode surrounding the insulator, and having an edge which cooperates with the tip to generate a plasma; and

d) a third electrode embedded in the insulator, having

no part exposed to the first electrode.

15. Igniter according to claim 14, wherein operation of the igniter causes part of the insulator to erode, thereby causing part of the third electrode to become exposed to the tip.

16. Igniter according to claim 14, and further comprising a sensor connected to the third electrode, for detecting current in the third electrode.

17. Igniter according to claim 14, wherein the third electrode comprises a cylinder, and surrounds the first electrode.

18. An igniter for a gas turbine engine, comprising:

a) a first electrode;

b) a second electrode which cooperates with the first electrode to generate a plasma;

c) a third electrode;

d) a barrier between the third electrode and the first electrode which

i) blocks auxiliary plasma formation between the first and third electrodes at a time T1, and

ii) erodes after T1, to enable said auxiliary plasma formation.

19. An igniter for a gas turbine engine, comprising:

a) first and second electrodes which

i) cooperate to generate a plasma; and

ii) wherein plasma generation is accompanied by a change which inhibits later plasma generation; and

b) a third electrode which

i) becomes available with said change; and

ii) cooperates with either the first or second electrode to generate a plasma.

20. An igniter for a gas turbine engine, comprising:

a) a first electrode;

b) a second electrode which cooperates with the first electrode to generate a plasma; and

c) a third electrode which

i) is separated from the first electrode by an erodible shield; and

ii) cooperates with the first electrode to generate a plasma when sufficient erosion of the shield occurs.

21. Igniter according to claim 20, wherein both the second and third electrodes cooperate with the first electrode to generate a plasma after predetermined erosion occurs.

22. An igniter for a gas turbine engine, comprising:

a) a first electrode, rod-like in configuration, coaxial with an axis;

b) an insulator surrounding the first electrode, except at a tip of the first electrode, where said tip is exposed;

c) a second electrode, generally cylindrical in configuration, coaxial with said axis, and surrounding the insulator and the first electrode;

d) a third electrode having a distal end, embedded in the insulator and completely surrounded by the insulator.

23. An igniter for a gas turbine engine, comprising:

a) a first electrode which changes in size during operation; and

b) a marker which becomes visible when a predetermined change in size occurs.